IN THE CLAIMS

1. (Previously Presented) A method for processing traffic in an access network, comprising:

receiving a plurality of ingress traffic streams, each ingress traffic stream including a plurality of packets having a destination address, wherein the packets are Internet Protocol (IP) packets and each include an IP destination address;

aggregating the ingress traffic streams into a single combined traffic stream without regard to any path or destination of any packet from any ingress traffic stream; and

transmitting the combined traffic stream to a backbone network for routing.

2. (Canceled).

3. (Original) The method of Claim 1, further comprising:

receiving each of the ingress traffic streams from customer premise equipment (CPE); and

transmitting the combined traffic stream to a backbone router in the backbone network.

4. (Previously Presented) The method of Claim 1, further comprising:

validating IP packets in the ingress traffic streams; and

aggregating all valid packets into the combined traffic stream.

5. (Previously Presented) The method of Claim 1, further comprising:

routing IP packets of the ingress traffic streams to a network interface port of an access device; and

aggregating the IP packets into the combined traffic stream at the network interface port.

6. (Previously Presented) The method of Claim 1, further comprising:

receiving the ingress traffic streams at a plurality of customer premise equipment (CPE) ports;

segmenting at the CPE ports the IP packets in the ingress traffic streams into asynchronous transport mode (ATM) adaption layer (AAL) cells, wherein the AAL cells include either or both of a virtual private interface and virtual connection interface (VPI/VCI) ATM address generated from the IP addresses of the IP packets;

switching the AAL cells to a network interface port;

reassembling the IP packets from the AAL cells at the network interface port; and

aggregating the IP packets into the combined traffic stream.

7. (Original) The method of Claim 6, further comprising:

segmenting IP packets at each CPE port into sets of AAL cells having a fixed ATM address associated with the CPE port;

buffering the AAL cells at the network interface port based on their ATM addresses; and

reassembling the IP packets from completed sets of AAL cells.

8. (Canceled).

9. (Original) The method of Claim 6, wherein the IP packets are segmented into ATM adaption layer five (AAL-5) cells.

10. (Previously Presented) The method of Claim 1, further comprising:

receiving an egress traffic stream from the backbone network, the egress traffic stream including a plurality of IP packets each having an IP address;

determining a customer premise equipment (CPE) port for each IP packet based on its IP address;

routing the IP packets to their respective CPE ports; and

transmitting the IP packets from the CPE ports to their destination CPEs.

11. (Original) The method of Claim 10, further comprising determining the CPE ports for the IP packets using a static routing table.

12. (Previously Presented) The method of Claim 10, further comprising:

determining an asynchronous transport mode (ATM) address for each IP packet of the egress traffic stream based on its IP address;

segmenting each IP packet into a set of ATM adaption layer (AAL) cells having the ATM address for the IP packet;

switching the AAL cells to their respective CPE ports based on the ATM addresses; and

reassembling the IP packets from the AAL cells at each CPE port for delivery.

13. (Original) The method of Claim 12, further comprising:

buffering the AAL cells at each CPE port based on their ATM addresses; and

reassembling the IP packets from completed sets of AAL cells.

14. (Previously Presented) The method of Claim 12, wherein the ATM address comprises either or both of a virtual private interface and virtual connection interface (VPI/VCI) address.

15. (Original) The method of Claim 12, wherein the IP packets are segmented into ATM adaption layer five (AAL-5) cells.

16. (Previously Presented) A system for processing traffic in an access network, comprising:

means for aggregating a plurality of ingress traffic streams from customer premise equipment (CPE) into a single combined traffic stream for transmission to a backbone network; and

means for routing egress traffic received from the backbone network to CPEs using a static routing table, wherein the ingress and egress traffic include a plurality of Internet Protocol (IP) packets each having an IP address, the IP address of IP packets in the egress traffic stream used as an index to the static routing table, wherein the plurality of ingress traffic streams are aggregated into the single combined traffic stream without regard to any path or destination of any IP packet from any ingress traffic stream.

17. (Canceled).

18. (Previously Presented) The system of Claim 16, further comprising:

means for segmenting IP packets into asynchronous transport mode (ATM) adaption layer (AAL) cells, wherein the AAL cells include either or both of a virtual private interface and virtual connection interface (VPI/VCI) address generated from the IP addresses of the IP packets;

means for switching the AAL cells within the access network; and

means for reassembling the AAL cells into outgoing IP packets.

19. (Original) The system of Claim 18, wherein the IP packets are segmented into ATM adaption layer five (AAL-5) cells.

20. (Previously Presented) A method for routing traffic in an access network, comprising:

receiving ingress Internet Protocol (IP) packets from customer premise equipment (CPE), each IP packet having an IP address;

receiving egress IP packets from a backbone network for delivery to the CPE;

segmenting the ingress IP packets at a CPE interface of an access network into ingress asynchronous transport mode (ATM) adaption layer (AAL) cells, wherein the ingress AAL cells include either or both of a virtual private interface and virtual connection interface (VPI/VCI) address generated from the IP addresses of the IP packets;

segmenting the egress IP packets at a network interface into egress AAL cells;

providing the egress AAL cells to the customer premises equipment;

aggregating the ingress AAL cells in the access network into a single combined traffic stream without regard to any path or destination of any packet from the customer premises equipment.

21. (Original) The method of Claim 20, wherein the IP packets are segmented into ATM adaption layer five (AAL-5) cells.

22. (Original) The method of Claim 20, further comprising reassembling the AAL cells into IP packets at a periphery of the access network.

23. (Original) The method of Claim 22, further comprising delineating the IP packets.

24. (Original) The method of Claim 22, further comprising validating the IP packets.

25. (Original) The method of Claim 22, further comprising dropping defective IP packets.

26. (Previously Presented) A system for processing traffic in an access network, comprising:

logic stored in a computer processable medium; and

the logic operable to receive a plurality of ingress traffic streams, each ingress traffic stream including a plurality of Internet Protocol (IP) packets having an IP address, aggregate the ingress traffic streams into a combined traffic stream without regard to any path or destination of any IP packet in any ingress traffic stream, and transmit the combined traffic stream to a backbone network for routing based on the IP addresses.

27. (Original) The system of Claim 26, the logic further operable to receive each of the ingress traffic streams from customer premise equipment (CPE).

28. (Original) The system of Claim 26, the logic further operable to transmit the combined traffic stream to a backbone router in the backbone network.

29. (Original) The system of Claim 26, the logic further operable to validate IP packets in the ingress traffic stream and to aggregate all valid packets into the combined traffic stream.

30. (Original) The system of Claim 26, the logic further operable to route IP packets in the ingress traffic streams to a network interface port of an access device and to aggregate the IP packets into the combined traffic stream at the network interface port.

31. (Previously Presented) The system of Claim 26, the logic further operable to receive the ingress traffic streams at a plurality of customer premise equipment (CPE) ports, segment at the CPE ports the IP packets in the ingress traffic streams into asynchronous transport mode (ATM) adaption layer (AAL) cells, switch the AAL cells to a network interface port, reassemble the IP packets from the AAL cells at the network interface port and aggregate the IP packets into the combined traffic stream, wherein the AAL cells include either or both of a virtual private interface and virtual connection interface (VPI/VCI) address generated from the IP addresses of the IP packets.

32. (Original) The system of Claim 31, wherein the IP packets are segmented into ATM adaption layer five (AAL-5) cells.

33. (Original) The system of Claim 31, the logic further operable to segment IP packets at each CPE port into sets of AAL cells having a fixed ATM address associated with the CPE port, buffer the AAL cells at the network interface port based on their ATM addresses, and reassemble the IP packets from completed sets of AAL cells.

34. (Canceled).

35. (Original) The system of Claim 26, the logic further operable to receive an egress traffic stream from the backbone network, the egress traffic stream including a plurality of IP packets each having an IP address, determine a customer premise equipment (CPE) port for each IP packet based on its IP address, route the IP packets to their respective CPE ports and transmit the IP packets from the CPE ports to their destination CPEs.

36. (Original) The system of Claim 35, the logic further operable to determine the CPE ports for the IP packets using a static routing table.

37. (Original) The system of Claim 35, the logic further operable to determine an asynchronous transport mode (ATM) address for each packet based on its IP address, segment each IP packet into a set of ATM adaption layer (AAL) cells having the ATM address for the IP packet, switch the AAL cells to their respective CPE ports based on the ATM addresses and reassemble the IP packets from the AAL cells at each CPE port for delivery based on their IP addresses.

38. (Original) The system of Claim 37 the logic further operable to buffer the AAL cells at each CPE port based on their ATM addresses and reassemble the IP packets from completed sets of AAL cells.

39. (Canceled).

40. (Original) The system of Claim 37, wherein the IP packets are segmented into ATM adaption layer five (AAL-5) cells.